

541,970

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
29 July 2004 (29.07.2004)

PCT

(10) International Publication Number  
**WO 2004/063430 A1**

(51) International Patent Classification<sup>7</sup>: **C30B 25/10**,  
25/02, 29/04, C23C 16/27, 16/511

(21) International Application Number:  
PCT/EP2003/007142

(22) International Filing Date: 18 June 2003 (18.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
03 00254 10 January 2003 (10.01.2003) FR

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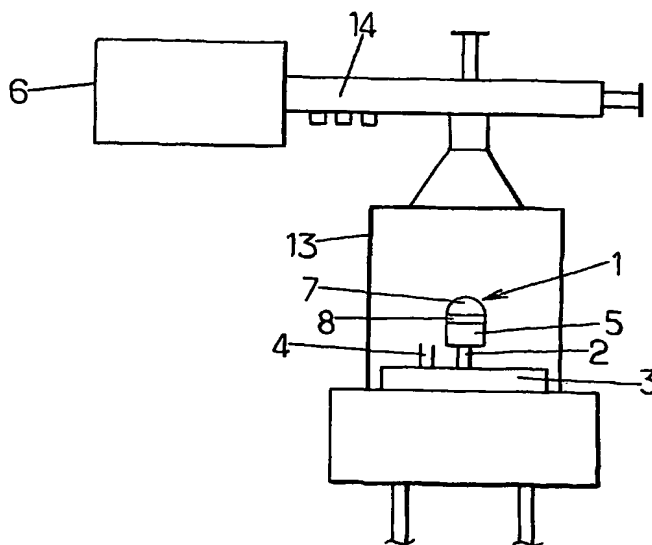
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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: HIGH-SPEED DIAMOND GROWTH USING A MICROWAVE PLASMA IN PULSED MODE



(57) Abstract: Method for manufacturing a diamond film of electronic quality at a high rate using a pulsed microwave plasma, in which, in a vacuum chamber, a plasma of finite volume is formed near a substrate by subjecting a gas containing at least hydrogen and carbon to a pulsed discharge, which has a succession of low-power states and of high-power states, and having a peak absorbed power  $P_e$ , so as to obtain at least carbon-containing radicals in the plasma and to deposit the said carbon-containing radicals on the substrate in order to form a diamond film thereon. Power is injected into the volume of the plasma with a peak power density of at least 100 W/cm<sup>3</sup>, while maintaining the substrate to a substrate temperature of between 700°C and 1000°C.

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ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

**Declaration under Rule 4.17:**

— of inventorship (Rule 4.17(iv)) for US only

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